REMARKS

Claims 1-5, 7-11, 13-19, 21-25, and 27-31 remain in this application, and have been amended to define still more clearly what Applicants regard as their invention. Claims 6, 12, 20, and 26 have been canceled without prejudice or disclaimer of subject matter. Claims 1, 7, 15, and 21 are independent.

The Abstract has been amended and is presented on a separate sheet, and accordingly withdrawal of the objection thereto is respectfully requested.

The specification has been amended in response to the objections set forth in paragraphs 2 and 3, and withdrawal of these objections is respectfully requested as well.

Claims 5, 11, 19, and 25 were rejected under 35 U.S.C. § 112, first paragraph, for allegedly not being supported by an enabling disclosure. The Office Action states that the phrase "transformed zone by zone, a zone of the signal being processed at all the resolution levels before passing on to a following zone" is not clearly described. The Examiner has interpreted this phrase to mean block by block or sub-band by sub-band of the signal.

The term "zone" is explained in the specification, at least from page 10, line 13 to page 11, line 16, in connection with Fig. 6. A zone of the image is a region called a macroblock in which blocks are formed. The number of blocks in a macroblock depends on the number of resolution levels. The order of processing of the blocks is depicted in Fig. 6 by a continuous line. A macroblock is totally run through before passing to the following macroblock (see, e.g., page 11, lines 3-9).

Accordingly, withdrawal of the rejection under Section 112, first paragraph, is respectfully requested.

Claims 1, 7, 15, 21, 27, and 29-31 were rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent 6,501,860 to Charrier et al. Claims 2-4, 6, 8-10, 12-14, 16-18, 22-24, 26, and 28 were rejected under 35 U.S.C. § 103(a) as being obvious from Charrier et al. in view of U.S. Patent 6,487,318 to Cho.

First, cancellation of Claims 6, 12, 20, and 26 renders the rejections of those claims moot.

The present invention is intended to ameliorate certain problems encountered when transforming digital signals and filtering digital signals. Wavelet transforms provide one filtering technique. These filtering processes are generally performed by subassemblies integrated into the coding and/or decoding assemblies. They often require a large amount of random access memory or buffer space for storing data in the course of processing. For example, in image processing, the most conventional solutions for producing the wavelet transform consist of loading the entire image to be processed into memory and then effecting the different filtering steps. Typically, the memory space is then so large that it is difficult to implement such filterings in devices such as photographic devices, facsimile machines, printers, and photocopiers. The present invention is intended to ameliorate these problems.

Claim 1 is directed to a method of transforming a digital signal representing a physical quantity into signals of frequency sub-bands distributed in at least two different frequency bands and in at least two different resolutions. The signal is divided into first blocks, all having the same predetermined first number of samples. Each of the first blocks is transformed into a plurality of second blocks, any second block under consideration having a second respective number of samples which depends on the resolution of the

second block under consideration, and containing samples selected according to their frequency. Second blocks, having the same second number of samples and samples selected according to the same frequency band, and issuing from the transformation of different first blocks, are grouped in order to form third blocks all having a same predetermined third number of samples which is at least equal to the largest of the second numbers.

Charrier et al. relates to digital signal coding and decoding based on sub-bands. Charrier et al. discusses a digital signal coding method including a step of analyzing the digital signal into a plurality of frequency sub-bands distributed in at least two different frequency bands, at least one first sub-band having a lower frequency and at least one second sub-band having a higher frequency. For each second sub-band, the method includes the steps of dividing the second sub-band into blocks, selecting first blocks and second blocks according to a selection criterion, preprocessing the first blocks by applying a first preprocessing mode, preprocessing the second blocks by applying a second preprocessing mode, and coding the sub-band including the preprocessed blocks by applying a third coding mode. (See column 7, lines 41-57.) Fig. 12, cited by the Examiner, relates to a method of coding an image IM, implemented in the coding device. The coding method uses two coding modes which can be allocated to the blocks according to a criterion.

Thus, the Charrier et al. coding method is one in which the signal is analyzed into frequency sub-bands. Blocks are formed in the sub-bands and a coding mode is allocated to each block according to a coding cost (see column 15, line 54, to column 16, line 2). One of the coding modes is a setting to zero. Blocks which are not to be coded by

this mode are linked to form a series of blocks $\{B_m\}$ (see column 13, lines 7-17, and column 16, lines 21-32).

First, it is to be noted that in Charrier et al., the signal is first transformed into frequency sub-bands, and then blocks are formed in the sub-bands. In the method of Claim 1, on the other hand, the signal is first divided into blocks, and then the blocks are transformed into frequency sub-bands. The results of these two processings are completely different.

Second, paragraph 5 of the Office Action states that Charrier et al. teaches "dividing the signal into blocks (Fig. 12) and selecting first and second blocks and transforming (preprocessing) the second blocks by applying a second preprocessing mode and coding the sub-band including the preprocessed blocks by applying a third coding mode to form third blocks with the same predetermined number of samples." However, Applicants submit that in Charrier et al. at column 7, lines 41-57, while the method may include the step of "coding the sub-band including the preprocessed blocks, by applying a third coding mode," the preprocessed blocks in that method include both first and second blocks, each preprocessed by respective first and second preprocessing modes.

It should be noted that in Charrier et al., the number of blocks to be coded by a given coding mode depends on the result of the comparison of the coding cost of the coding modes. Consequently, the number of samples to be coded by a given coding mode also depends on the result of the comparison of the coding cost of the coding modes. This means that the number of samples cannot be predetermined in Charrier et al.

For at least these reasons, Claim 1 is believed to be clearly allowable over the cited references.

Independent Claims 7, 15, and 21 each include features which are similar to those discussed above in connection with Claim 1. Accordingly, Claims 7, 15, and 21 are believed to be patentable for at least the same reasons as discussed above in connection with Claim 1.

A review of the other art of record, including Cho, has failed to reveal anything which, in Applicants' opinion, would remedy the deficiencies of the art discussed above, as a reference against the independent claims herein. Those claims are therefore believed patentable over the art of record.

The other claims in this application are each dependent from one or another of the independent claims discussed above and are therefore believed patentable for the same reasons. Since each dependent claim is also deemed to define an additional aspect of the invention, however, the individual reconsideration of the patentability of each on its own merits is respectfully requested.

In view of the foregoing amendments and remarks, Applicants respectfully request favorable reconsideration and early passage to issue of the present application.

Applicants' undersigned attorney may be reached in our New York office by telephone at (212) 218-2100. All correspondence should continue to be directed to our below listed address.

Respectfully submitted,

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